

REMARKS

Summary of the Office Action

Claims 42-83 are pending. Claims 51, 56, 65-68, and 76 are withdrawn. Claims 47-50, 52-55, 57-63, 69-75, and 77-83 are rejected under 35 U.S.C. § 112, first paragraph. Claims 47-50, 52-55, 57-63, 69-75, and 77-83 are rejected under 35 U.S.C. § 112, second paragraph. Claims 42-43 and 45-46 are rejected under 35 U.S.C. § 102(b) over Gaisser et al. (GenBank Accession No. S80675; hereinafter “Gaisser”). Claim 44 is objected to as being dependent on a rejected base claim. Claim 64 is allowed. By this reply, Applicants cancel claims 44, 47-50, 52-55, 57-64, 69-75, and 77-83, amend claims 42, 43, 45, and 46, add new claims 84-124, and address each of the rejections below.

Support for the Amendments

In the Specification

To comply with the requirements of 37 C.F.R. § 1.821(d), Applicants have amended the specification to include sequence identifiers where appropriate. No new matter is added by these amendments.

In the Claims

Support for the amendment to claims 42, 43, 45, and 46 is found in the specification at, e.g., page 5, lines 10-12 and lines 18-23, page 6, lines 8-15, page 20, lines 9-22, and Figure 3. Support for new claims 84-89 is found in prior claims 1-4 and in the specification at, e.g., page 5, line 4, through page 6, line 15, page 20, lines 9-22, and Figure 3. Support for new claims 90-98

is found in prior claims 47, 55, and 57-62. Support for new claim 99 is found in prior claim 63. Support for new claims 100-107 is found in prior claims 69-75. Support for new claim 108 is found in prior claim 78. Support for new claim 109 is found in prior claim 81. Support for new claims 110-113 is found in the specification at, e.g., page 5, line 4, through page 6, line 15, page 20, lines 9-22, and Figure 3. Support for new claims 114-123 is found in prior claims 1-4 and 77, and in the specification at, e.g., page 5, line 4, through page 6, line 15, page 20, lines 9-22, and Figure 3. No new matter is added by the amendment.

Rejection under 35 U.S.C. § 112, second paragraph

Claims 47-50, 52-55, 57-63, 69-75, and 77-83 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Claims 47-50, 52-55, 57-63, 69-75, and 77-83 have been canceled. Thus, this rejection can now be withdrawn.

Rejection under 35 U.S.C. § 112, first paragraph

Written Description

Claims 47-50, 52-55, 57-63, 69-75, and 77-83 have been rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner states that “Applicant has disclosed only constructs comprising polynucleotides encoding modified maize gamma zein of 28kDa of P20-gamma-zein, H30-gamma-zein and H45-gamma-zein[, which] is not deemed adequate to encompass the genus of all...plant proteins reserve or otherwise” (Advisory Action, p. 2). Applicants respectfully disagree.

In an effort to expedite prosecution, Applicants have cancelled claims 47-50, 52-55, 57-63, 69-75, and 77-83, and have added new claims 90-109 and 114-123. New claims 90-109 recite that the recombinant nucleotide sequence includes a concatenation of nucleotides coding for maize γ -zein of 28 kDa, which further includes the oligonucleotide defined by claim 42 or claim 84. Accordingly, new claims 90-109 are no longer directed to any modified plant protein reserve, but rather a modified maize γ -zein of 28 kDa.

New claims 114-123 are directed to maize seeds that include a plant protein encoded by a recombinant nucleotide sequence having a concatenation of nucleotides coding for the plant protein. As newly provided, claims 114-123 are no longer broadly directed to the seeds of any plant; the claims are specifically directed to *maize* seeds.

Applicants believe that the subject matter of new claims 90-109 and 114-123 is described in considerable detail in the specification (see, e.g., pages 24-38 and Figure 3). Namely, the specification describes the construction, expression, and function of four exemplary species of modified maize γ -zeins (see, e.g., page 27, line 9, through page 30, line 18, and Figures 3 and 4), as well as the preparation of plants and seeds containing these constructs (see, e.g., page 35, line 20, through page 38, line 24). Thus, new claims 90-109 and 114-123 overcome the basis for the Examiner's rejection of prior claims 47-50, 52-55, 57-63, 69-75, and 77-83 because new claims 90-109 and 114-123 are now limited to modified maize γ -zein of 28 kDa and maize seeds, respectively, the genus of which is supported by the specification. For this reason, Applicants respectfully request that the rejection of claims 47-50, 52-55, 57-63, 69-75, and 77-83 under 35 U.S.C. § 112, first paragraph, be withdrawn, and that this rejection not be applied to new claims 90-109 and 114-123.

Enablement

Claims 47-50, 52-54, 57-61, 63, 69-75, and 77-83 have been rejected under 35 U.S.C. § 112, first paragraph, for lack of enablement. The Examiner states:

Applicant's argument that the modified protein of Claim 89 is a gamma zein is not commensurate in scope with the claims as the claims are not limited to a modified maize gamma zein of 28kDa. The claim is broadly drawn to a plant protein recited in line 2 [of] Claim 89 that has no structural [sic] link to the maize gamma zein of 28kDa recited in the last line of the claim. (Advisory Action, p. 2.)

Applicants have cancelled claims 47-50, 52-54, 57-61, 63, 69-75, and 77-83. The subject matter of these claims is now provided as new claims 90-109 and 114-123, which correspond to claims 89-97 and 98-110 which were presented in the Reply to Final Office Action filed on February 10, 2005.¹ As is discussed above, new claim 90, from which claims 91-109 depend, now clearly recites that the modified plant protein reserve is a modified maize γ -zein of 28 kDa. Accordingly, the relevant claims are now limited to a modified maize γ -zein of 28kDa.

As noted above, new claims 114-123 are directed to *maize* seeds that include a plant protein encoded by a recombinant nucleotide sequence having a concatenation of nucleotides coding for the plant protein.

Applicants believe that the subject matter of new claims 90-109 and 114-123 is described in enabling detail in the specification (see, e.g., pages 24-38). As is discussed above, the

¹ Claims 89-97 and 98-110 submitted with the Reply to Final Office Action on February 10, 2005 were not entered by the Examiner. The claims referenced by the Examiner in the Advisory Action correspond to these unentered claims. Present claim 90 corresponds to the previously submitted, but not entered, claim 89.

specification provides four representative examples of modified maize γ -zeins; the four representative species are sufficient to enable the genus of modified maize γ -zeins and maize seeds recited in the present claims. The Examiner states that because claims 47-50, 52-54, 57-61, 63, 69-75, and 77-83 are not limited to a modified maize γ -zein of 28 kDa, the claims are not commensurate in scope with the teachings of the specification (Advisory Action, p. 2).

Applicants have addressed the basis of the Examiner's rejection by cancelling claims 47-50, 52-54, 57-61, 63, 69-75, and 77-83 and providing new claims 90-109, which are now limited to a modified maize γ -zein of 28 kDa. Applicants also submit new claims 114-123, which are limited to *maize* seeds containing a modified protein reserve. Thus, Applicants submit that new claims 90-109 and 114-123 overcome the basis for the Examiner's rejection of prior claims 47-50, 52-55, 57-63, 69-75, and 77-83 for lack of enablement. Because new claims 90-109 and 114-123 are enabled by the specification, Applicants respectfully request that the rejection of claims 47-50, 52-55, 57-63, 69-75, and 77-83 under 35 U.S.C. § 112, first paragraph, be withdrawn, and that this rejection not be applied to new claims 90-109 and 114-123.

Rejection under 35 U.S.C. § 102(b)

Claims 42-43 and 45-46 have been rejected under 35 U.S.C. § 102(b), as being anticipated by Gaisser. The Examiner states that "the reference teaches $K-[P-K]_n$ where $n=5$, and thus the reference teaches all the limitations of Claims 42-43 and 45-46" (Office Action, p. 7). Applicants have amended independent claim 42, from which claims 43, 45, and 46 depend, to recite an oligonucleotide having at least two concatenations encoding a polypeptide having the formula $(P-K)_n$, in which at least one of the concatenations has greater than two (P-K) units (i.e.,

n>2). Claim 42 also recites that the two polypeptide sequences encoded by the two concatenations are separated by one or more amino acid residues, in which the residue(s) is not a P or a K residue. In view of the amendment to claim 42, present claims 42-43 and 45-46 can now be distinguished from Gaisser.

Gaisser discloses the sequence of the tonB gene. The relevant polypeptide sequence disclosed by Gaisser is as follows:

KPKPKPKPKPKVEKQVKPEPKK

This sequence can be represented as K-(P-K)₅-X-(P-K)₁K. The sequence disclosed by Gaisser includes five consecutive (P-K) units and a single (P-K) unit which are interrupted by the amino acid sequence VEKQVKPE. In contrast, present claim 42 recites an oligonucleotide having two concatenations, at least one of which encodes, at a minimum, a polypeptide sequence having at least three consecutive (P-K) units; the two concatenations being separated by one or more amino acid residues, excluding proline and lysine residues. Thus, the minimum polypeptide sequence encoded by the oligonucleotide of present claim 42 can be represented as follows:

$$[(P-K)_{n1}]-X-[(P-K)_{n2}],$$

where the [] denotes a concatenation, at least one of n₁ or n₂ > 2, and X is one or more amino acids (excluding P or K).

Gaisser fails to teach or suggest each and every limitation of present claim 42 because the amino acid sequence disclosed by Gaisser includes two (P-K) concatenations separated by an amino acid sequence that includes both a proline and a lysine residue. As presently amended, claim 42 excludes the sequence disclosed by Gaisser. Because claims 43, 45, and 46 depend from claim

42, Gaisser also fails to teach or suggest all of the limitations of these claims as well. For the reasons given above, Applicants respectfully request that the rejection of claims 42, 43, 45, and 46 under 35 U.S.C. § 102(b) for anticipation over Gaisser be withdrawn.

Applicants have also added new claims 84-89 and 110-113. The rejection of claims 42, 43, 45, and 46 under 35 U.S.C. § 102(b) for anticipation over Gaisser should not be applied to new claims 84-89 and 110-113 because these claims can be distinguished as well. New independent claim 84, from which new claims 85-89 depend, recites an oligonucleotide having at least two concatenations, both of which encode, at a minimum, a polypeptide sequence having at least three consecutive (P-K) units. Thus, the minimum polypeptide encoded by the oligonucleotide of new claim 84 can be represented as follows:

$$[(P-K)_n]-[(P-K)_n],$$

where the [] denotes a concatenation and $n=3$ or more.

Gaisser fails to teach or suggest each and every limitation of new claim 84. The polypeptide sequence disclosed by Gaisser includes two concatenations of five consecutive (P-K) units and one (P-K) unit; the two concatenations are separated by the amino acid sequence VEKQVKPE. Gaisser does not disclose a polypeptide sequence having two, three (P-K) unit concatenations. Absent this disclosure, Gaisser fails to teach or suggest each and every limitation of new claim 84, and new claims 84-89 dependent therefrom.

Gaisser also fails to teach or suggest each and every limitation of new claim 110. New independent claim 110 is directed to an oligonucleotide having at least two concatenations, both

of which encode, at their minimum, a polypeptide sequence having at least three consecutive (P-K) units, in which one or more amino acids, excluding proline or lysine residues, separate at least one concatenation from a second concatenation. Thus, the minimum polypeptide encoded by the oligonucleotide of new claim 110 can be represented as follows:

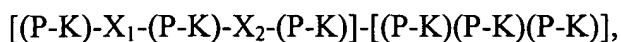
$$[(P-K)_n]-X-[(P-K)_n],$$

where the [] denotes a concatenation, $n > 2$, and X is one or more amino acids (excluding P or K).

Gaisser fails to teach or suggest each and every limitation of new claim 110. As is discussed above, Gaisser merely discloses a polypeptide sequence having five consecutive (P-K) units and a single (P-K) unit which are interrupted by the amino acid sequence VEKQVKPE. Gaisser does not disclose a polypeptide sequence having at least two concatenations of greater than 2 (P-K) units each, nor does Gaisser disclose that the amino acid sequence separating the concatenations excludes proline and lysine residues. In fact, the sequence disclosed by Gaisser includes both a proline and a lysine residue. Thus, Gaisser does not disclose a polypeptide sequence having the limitations of new claim 110.

Finally, Gaisser fails to teach or suggest each and every limitation of new claims 111-113. New independent claim 111, and claims 112-113 dependent therefrom, is directed to an oligonucleotide having at least two concatenations that encode, at their minimum, a polypeptide having two sequences of greater than two (P-K) units each, in which the sequence of n (P-K) units of one of the concatenations is interrupted at least once, between two (P-K) units, by one or more amino acids, excluding proline or lysine residues. Thus, the minimum polypeptide encoded

by the oligonucleotide of new claim 111 can be represented as follows:



The [] denotes a concatenation.

At least one of X_1 or X_2 is present, and X_1 or X_2 = one or more amino acids (excluding P or K).

Gaisser fails to teach or suggest each and every limitation of new claim 111, and claims 112 and 113 dependent therefrom. As is discussed above, Gaisser merely discloses a polypeptide sequence having five consecutive (P-K) units and a single (P-K) unit which is interrupted by the amino acid sequence VEKQVKPE. Gaisser does not disclose a polypeptide sequence having at least two concatenations of greater than 2 (P-K) units each, in which one of the two concatenations further includes at least one interruption between two (P-K) units, in which the interruption includes one or more amino acids excluding proline or lysine. Because the oligonucleotide of new claims 111-113 is not taught or suggested by Gaisser, Applicants respectfully request that the rejection of claims 42, 43, 45, and 46 under 35 U.S.C. § 102(b) for anticipation over Gaisser not be applied to these claims.

CONCLUSION

Applicants submit that the claims are in condition for allowance and such action is respectfully requested.

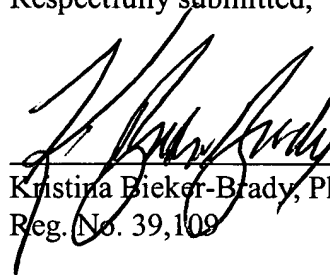
Enclosed is a petition to extend the period for replying for two months, to and including October 13, 2005.

If there are any other charges or any credits, please apply them to Deposit Account No. 03-2095.

Respectfully submitted,

Date: _____

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